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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/489,515	01/21/2000	Surya Prakash	06618-408001	5938
20985	7590	01/11/2005	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			MERCADO, JULIAN A	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/489,515

Applicant(s)

PRAKASH ET AL.

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-27 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-27 and 29-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Remarks***

This Office action is responsive to applicant's amendment filed October 27, 2004.

Claims 18-27 and 29-31 are pending.

This Office action presents a new ground of rejection and is therefore made NON-FINAL.

### ***Claim Rejections - 35 USC § 112***

The rejection of claims 11-17 under 35 U.S.C. 112, first paragraph and claims 14 and 15 under 35 U.S.C. 112, second paragraph, is deemed moot in view of the cancellation of these claims.

### ***Claim Rejections - 35 USC § 102 and 103***

The rejection of claims 19-23, 25, 27, 29 and 30 under 35 U.S.C. 102(e) based on Cabasso et al. (U.S. Pat. 5,783,325) has been withdrawn.

The rejection of claim 28 under 35 U.S.C. 103(a) based on Cabasso et al. and Scherer et al. (U.S. Pat. 5,656,386) has been withdrawn.

The rejection of claim 26 under 35 U.S.C. 102(e) or 35 U.S.C. 103(a) based on Cabasso et al. has been withdrawn.

The rejection of claims 24 and 31 under 35 U.S.C. 103(a) based on Cabasso et al. and Lawrance et al. (U.S. Pat. 4,272,353) has been withdrawn.

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New rejection :

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 18 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by Narayanan et al. (U.S. Pat. 5,945,231)

See col. 6 line 1-3 and line 23-46.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim 26 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Prakash et al. (U.S. Pat. 6,444,343 B1)

Claim 26 recites a product-by-process limitation of the instant providing, applying and bonding of a catalyst ink. These process limitations have not given patentable weight as the limitations do not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as being a fuel cell comprising a catalyzed membrane electrode assembly with a PSSA-PVDF membrane. In the event that any differences can be shown by the product of the product-by-process claims, such differences would have been

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obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

Claims 19, 20 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grot et al. (U.S. Pat. 5,919,583) in view of Fleisher et al. (U.S. Pat. 5,643,689)

Grot et al. teaches a Pt catalyst ink material for a fuel cell, with a binder disclosed as being preferably the same polymer as in the membrane. (col. 8 line 41 et seq.) When combined with Fleisher et al. (for the reasons not yet discussed) who teach a membrane having a polyvinylidene fluoride polymer, the skilled artisan would find obvious without undue experimentation to employ the same polymer as a binder so as to remain consistent with Grot et al.'s disclosure. Employing a catalyst ink comprising the same polymer as in the membrane would be an obvious modification to the skilled artisan in order to enhance the bonding of the catalyst ink to the membrane, e.g. the well-known "like dissolves like" approach.

In Grot et al. the temperature of bonding is from 150° C to 280° C. (col. 9 line 45-58) This range is considered to teach or at least suggest the claimed greater than about 180° C. (applies to claim 20)

Grot et al. does not explicitly teach a PSSA-PVDF membrane. However, Fleisher et al. teaches a matrix polymer, such as polyvinylidene fluoride (PVDF), together with a second polymer such as sulfonated polystyrenes. (col. 7 line 39-45, col. 8 line 40-62) The membrane is readable on the claimed PSSA-PVDF membrane combination. The skilled artisan would find obvious to employ this membrane in Grot et al.'s invention for reasons such as an improved

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electrical contact of the membrane within the formed membrane/electrode assembly. (col. 4 line 61 et seq.)

Claims 21, 22, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grot et al. in view of Fleisher et al. as applied for claims 19, 20 and 25-27 above, and further in view of Cabasso et al. (U.S. Pat. 5,783,325)

The teachings of Grot et al. and Fleisher et al. are discussed above.

Grot et al. does not explicitly teach a plasticizer. However, Cabasso et al. teaches in column 7 line 64 et seq: “[s]uitable solvents for the polyvinylidene fluoride and carbon blend include... N,N-dimethyl acetamide (“DMA”)”, the solvent notably dissolving the polyvinylidene fluoride. The examiner notes that DMA is the same solvent disclosed by applicant as that which provides a plasticizing effect. The skilled artisan would find obvious to further modify Grot et al.’s invention by employing a plasticizer in order to enhance the dissolution of the polymeric material with the catalyst ink.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grot et al. in view of Fleisher et al. as applied for claims 19, 20 and 25-27 above, and further in view of Kindler (U.S. Pat. 5,992,008).

The teachings of Grot et al. and Fleisher et al. are discussed above.

Grot et al. does not explicitly teach a second ionomer comprising a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid. However, Kindler teaches such a liquid copolymer. (col. 3 lines 36-38, col. 6 line 28 *et seq*) At the time the invention was made, it

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would have been obvious to one of ordinary skill in the art to further modify Grot et al.'s invention by employing a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid for reasons such as enhancing ionic conduction within the electrode.

Claims 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grot et al. in view of Fleisher et al. as applied for claims 19, 20 and 25-27 above, and further in view of Kindler (U.S. Pat. 5,992,008).

The teachings of Grot et al. and Fleisher et al. are discussed above.

Grot et al. does not explicitly teach roughening the surface of the membrane prior to applying the catalyst ink. However, Lawrance et al. teach such a roughening step. (col. 2 line 55-59) While the examiner maintains that the skilled artisan would find such a step obvious for reasons such as increasing the surface area of the membrane, in view of Lawrance et al. a roughening step would be an obvious modification motivated by the enhanced bonding of the catalysts to the membrane support, as roughening provides for locking, uniting and fixing of the catalyst particles on the membrane surface.

### ***Conclusion***

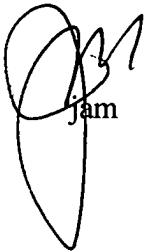
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



jam



**PATRICK JOSEPH RYAN**  
**SUPERVISORY PATENT EXAMINER**